# Unique program prepares Texas students for careers in engineering

Hundreds of high school juniors from across Texas are improving their aptitude in math, science, engineering, and computer science via a unique online distance learning project. They're participating in the Texas Aerospace Scholars Program, an educational outreach program that recently began between JSC and the State of Texas. The objective is to increase the number of students choosing to enter the engineering field.

"The United States continues to see a decline in the number of students pursuing degrees in science and engineering," said Mike Kincaid, chief of the HR Development Branch. "This is one way that we can help reverse the decline."

The focus of study for the initial 12-week spring semester, which began in February, is the exploration of Mars. The six-unit curriculum covers the history of Mars, geology of Mars, robotic exploration, human factors, first human missions, and possible Martian colonization. Each unit has a series of chapters, an assignment to be turned in via e-mail, an interactive online quiz, and ideas for a final project that the students are required to turn in at the end of the semester. Each unit also includes many links to virtual reality models, simulations, interactive tutorials, videos, animations and information sites for additional research.

Students access the curriculum via the Internet at http://aerospacescholars.jsc.nasa.gov. After reviewing the lesson material, they complete their assignment on-line and take the unit quiz. In addition, the students conduct research, submit research questions and design their unit specific missions. They have two weeks to complete each unit. Since the curriculum is a combination of research report writing, essay writing, and design drawing, by the time they get to their final projects, they'll have an idea of what topic is of most interest to them about Mars exploration. At the end of the semester, they will submit their final projects to be posted on the Web.

There is also plenty of on-line assistance if the students need additional help. Mentors, comprised of JSC civil servants and contractor employees, teachers, and school counselors, will be available for e-mails and online chat sessions. JSC co-ops will help out as well and share their insight.

The spring semester curriculum will be followed by a one-week summer session at JSC. To maximize the learning opportunity, the students have been divided into eight different weeks and are scheduled to visit JSC in June and July. During each session, the students will work in teams with a mentor, a teacher, and a co-op on Mars exploration projects, and present a project on "Getting There, Living There, and Working There." To accomplish this, each team will look at propulsion systems for travel to Mars, engineering designs for Martian habitats, human factors in long-duration space travel, and numerous other issues that are facing engineers and scientists. The teams will display their projects for family members, Texas legislators, NASA officials, and other guests during a banquet to be held at the end of the week.

In addition to completing the team project, the students will tour JSC facilities and take field trips to Space Center Houston, Moody Gardens, and the Houston Museum of Natural Science Challenger Center during the summer session. Students will receive briefings from JSC engineers, scientists, and astronauts, and spend some time visiting their mentor's work environments.

Students from around Texas were nominated to attend this program by the 181 members of the Texas Legislature. Each legislator selected one or two students from their district to nominate for the program. In addition, a donation from the Rotary National Award for Space Achievement Foundation raised the total number of students enrolled in the spring semester from 200 to 230.

Enrollment for the fall semester is expected to double, and additional lessons on the Space Shuttle, International Space Station, and Moon Exploration will be added to the Mars lessons to increase the curriculum to 24 weeks. The fall and spring online session will be followed by a one-week visit to JSC in the summer of 2001.

Applications for the fall semester, the 2000-2001 program, will go to the Texas legislators in August. Applicants must be at least 16 years of age and be in their junior year in high school. Other desired characteristics include U.S. citizenship; Texas residency; an interest in and an aptitude for math, science, engineering, or computer science; the ability to commit to a one-year relationship with JSC, including a designated one-week residential experience; and accessibility to the Internet (home, school, or public library).

The students will be selected in October and complete their online work from November to May 2001.

JSC needs volunteers to serve as mentors this spring and summer. Those interested may obtain information and complete an online mentor application via the Web site: http://aerospacescholars.jsc.nasa.gov/ ■

Continued from Page 4

# ENGINEERS

leadership in future engineering achievements depends upon ensuring that the nation's base of engineering support continues, Dr. Dunbar said.

Dr. Dunbar stated that the future of space exploration will depend upon developing the pipeline of engineers in an increasingly competitive engineering environment. "While we have many time commitments at JSC given our multiple missions, I am appreciative of all those who devoted some of their time to visit a classroom and to discuss engineering careers. It is an investment in the future of exploration and our country."

The students at League City Elementary School are still talking about Walheim's presentation.

"I showed slides of a typical shuttle mission and talked about all the different types of engineers involved, such as civil engineers who designed the launch pad, chemical engineers who developed the propellants, and mechanical engineers who designed the vehicle structures," said Walheim. "The class asked insightful questions and was quite interested in engineering and the space program. I received letters from the students afterwards, and from what they wrote, I could tell that they really had listened intently, and understood the points I was trying to get across. It was a very enjoyable experience."

Johnson spoke to a group of fourth grade classes at Hyde Elementary, also in League City. "The teachers contacted me ahead of time, so we were able to coordinate a lesson that meshed nicely with their curriculum. The science topic of the week was Earth science, so we discussed gravity. Not only did the kids enjoy hands-on exercises with an inflatable shuttle and Earth, but also they were intrigued by the concept of zero gravity. We have lots of zero-gravity videos here to show from actual shuttle missions. I'm sure they had fun, but I also think they learned a thing or two. I know I enjoyed it."

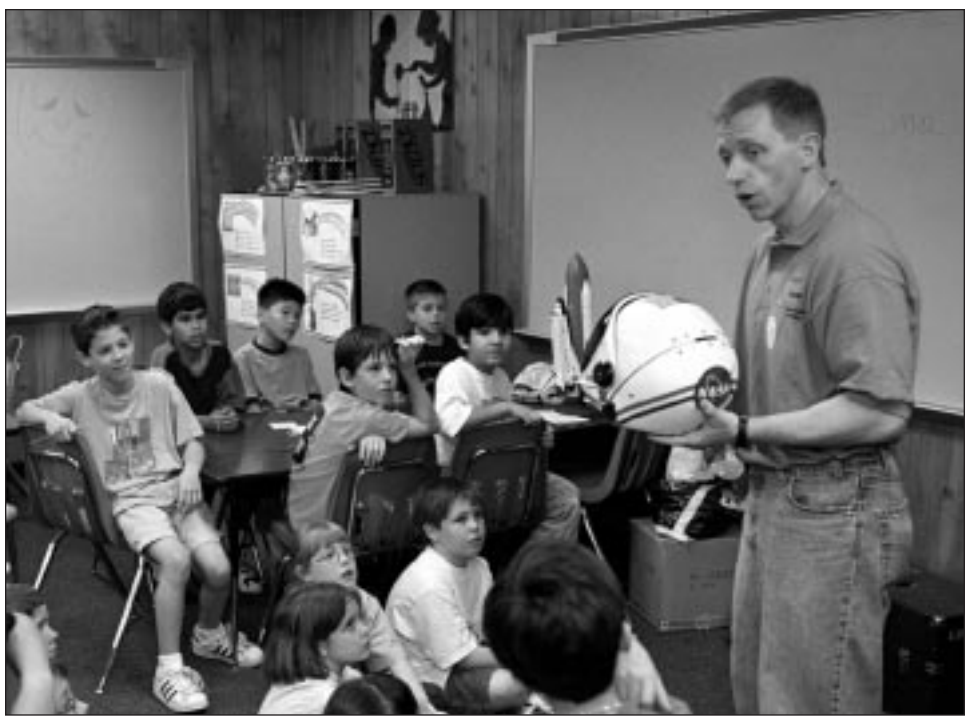
Evaluation forms received from teachers were highly positive about the presenters. "One of the best speakers I've ever invited to my class in 17 years of teaching," wrote Mary Patterson of Hamilton Middle School. "The speaker demonstrated excellent rapport with the students."

Teachers and students alike came away with an increased understanding of engineers and engineering as a result of the school visits. "The presenter did an excellent job in engaging the students," wrote Mary Sanchez of Jessup Elementary in the Pasadena Independent School District. "The students responded very enthusiastically and came away with a clearer understanding of the varied opportunities in the field of engineering. We were all impressed."

JSC's Education Outreach Program provides volunteers for local schools year-round, and volunteers are always needed. Employees can help educators inspire students by participating as guest speakers, career day speakers, science fair judges, mentors, and serve as science advisors through the SciAd program. ■

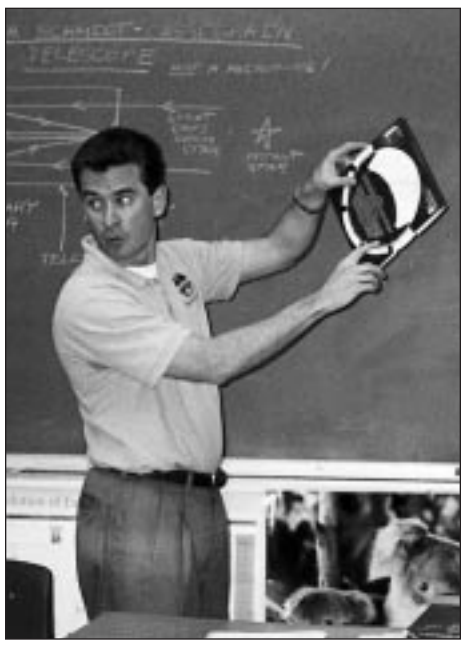
NASA JSC Photo JSC2000-01932 by Benny Benavides

**Dr. Bonnie Dunbar, NASA astronaut and JSC assistant director for University Research and Affairs, presents a framed collage of photos and a patch from her STS-89 mission to Sharmaine Perrilloux, assistant principal of La Marque High School. Dr. Dunbar spoke to students at the school as part of National Engineers Week activities.**



NASA JSC Photo 2000-01786 by

**Pat Daily, Honeywell, lectures third graders at Yeager Elementary School.**



**Bruce Powers, engineering staff, Guidance and Control Systems, United Space Alliance, lectures on astronomy and aerospace engineering at Harby Junior High School in Alvin.**